THE

CRESCENT CELLS

OF

GIANUZZI.

BY

PROFESSOR HENEAGE GIBBES.

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THE CRESCENT CELLS OF GIANUZZI.

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THE crescent cells of Gianuzzi, or demilunes of Heidenhain, are described as crescentic masses lying outside the cells lining the acini of a mucous gland, but inside the membrana propria. They are found in the submaxillary and orbital glands of the dog, and the sublingual of the rabbit.

According to Heidenhain, Lavdovsky and others, their function is to replace the mucous cells when these become exhausted.

I have for a long time felt grave doubts as to the existence of these cells; and the peculiar function ascribed to them does not seem one that is consistent with any arrangement in the body for renewing cells which have become effete.

With a view to get a further insight into their characters, I made a series of experiments on various mucous glands, and from these I have drawn conclusions which may prove of interest. In the first place, I examined the submaxillary glands of the dog and the sublingual of the rabbit, taking a number of each in different stages of secretion, that is, when the secretion was taking place under normal conditions.

I then examined a number of others which were removed from animals where profuse salvation had been caused by the injection of various drugs.

In this way I had the glands in every condition, from the lowest normal to the highest stage of hyper-secretion, and exhaustion consequent on it.

I also examined the submaxillary and the admaxillary glands of Guinea pigs, and the mucous glands of the tongue in the dog and cat.

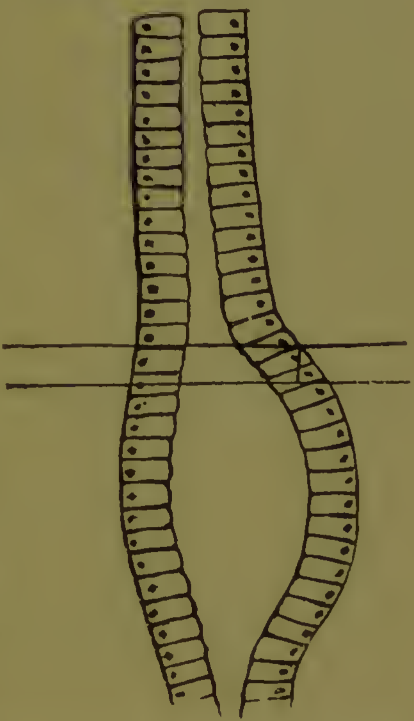
The glands were hardened in various ways with spirit and chromic acid, but always with the view to keep the component elements as near their condition during life as possible. I shall merely give the results of these various examinations, and the conclusions which I have drawn from them.

I found that the appearances. which have so often been described and figured, occurred not only in the submaxillary and the orbital glands of the dog, and sublingual of the rabbit, but also in many other glands, such as the mucous glands of the human trachea in certain conditions. and in the mucous glands of the lip of the ape, and others. On careful and prolonged examination I was unable to find, in many hundreds of specimens, any case where these crescent cells could be seen in the longitudinal section of a tube. They only occur where the gland tube is cut transversely or obliquely. Now in the case of the glands in the cardiac end of the stomach, where the parietal cells are placed exactly in the same manner as these crescent cells are supposed to be, *i. e.* under the membrana propria, it is impossible to cut a section of the cardiac end of the stomach, either vertical, horizontal or oblique, without showing these parietal cells more plainly even than those lining the glands. I never had the slightest difficulty in seeing that whereas the mucous gland-tube was cut longitudinally there were no crescent cells.

Now as some portion of the gland-tubes were cut longitudinally for some distance, and there were many such in the number of sections examined, there certainly ought to have been places where these crescent cells could be seen bulging out the walls of the tube. Such, however, was not the case.

It seems to me that these appearances are capable of a very simple explanation. Any one carefully examining those gland-tubes that are cut longitudinally, will notice that their calibre is by no means uniform throughout, but that here and there are dilatations where the tube is very much larger, and this occurs quite suddenly in many places.

Now if a gland-tube is cut through at the seat of this dilatation, the appearances presented would be somewhat like those shown in the following rough diagram, the transverse parallel lines representing the thickness of the section.



Every section has an appreciable thickness, and a tube cut through transversely at the seat of the dilatation would present a portion of its wall obliquely when viewed through the microscope from above, and the membrana propria would lie diagonally across the field of vision, and would include one or more cells and their nuclei according to the thickness of the section. This would cause this portion of the wall to appear to be more deeply stained than the rest, and when stained with some anilin color, it would have a different tinge, which would be produced by the different arrangement of the elements in that portion of the tube. This difference is of course very faint, but is nevertheless discernable in well prepared specimens.

Some years back I pointed out to Dr Klein the views I held as to the crescent cells being merely optical effects, and he informed me that they had been isolated, but he could not say by whom. I have never been able to find satisfactory evidence that any one has demonstrated them as independent cells. Dr Klein, in his small work on histology has adopted my views in his description of the mucous alveoli of the human sublingual, although he still describes crescent cells in that of the dog.

I contend that these so-called crescent cells are merely appearances produced by the angle at which the tube is cut, owing to its being dilated at this point; and that this is so can be easily verified by any one with a binocular microscope. With a one-half inch objective you can look right into the tubes; and here let me say that no competent investigator should neglect the binocular microscope in histological or pathological researches. With this instrument correct ideas can be obtained of the form and relation of structure which it is impossible to get with the monocular. I have shown in a paper published in the *Quarterly Journal of Microscopical Science*, in 1880, that the ordinary binocular can be used with high powers, and I have no difficulty in getting perfect and even illumination with a one-sixteenth oil immersion objective.

It has been stated that these crescent cells have a different reaction to staining agents than those of the mucous cells of the glands. The explanation of this is I think the following: There is no doubt that in some glands mucous and serous cells occur in the same tube, as has been pointed out by Klein, but I have observed in the mucous glands of the tongue of the dog and cat, some tubes where not only were there mucous and serous cells, but some of the cells were themselves part mucous and part serous, the mucous being the inner portion nearest the lumen of the tube. And these cells would stain perfectly with two distinct colors. They then had a striking resemblance to the gland-tubes with so-called crescent cells, and these cells had a different reaction which was very plain.

This would seem to me to be the probable cause of the statement that the crescent cells have a different reaction from that of the mucous cell of a gland. This transition is an interesting one, and more so, I think, when it is shown that a chemical change is so marked that you can stain one portion of a cell in the transition state red and the other part blue. I may mention, however, that I have not seen the transition stage in glands where the character is so well marked as in the submaxillary of the dog, or in that of the Guinea pig, where there is a distinct admaxillary gland.

The chemical changes in cells as shown by their reaction to staining agents is well worth working out. And that these are important has been shown by Ehrlich and others; and in the growth and development of cancer cells I have found a marked change in the various stages, for a description of which see my paper in the *American Journal of the Medical Sciences*, for August. 1889, on secondary growth in cancer.